Date: Tue, 20 Apr 93 20:01:25 PDT
From: Ham-Policy Mailing List and Newsgroup <ham-policy@ucsd.edu>
Errors-To: Ham-Policy-Errors@UCSD.Edu
Reply-To: Ham-Policy@UCSD.Edu
Precedence: Bulk
Subject: Ham-Policy Digest V93 #108
To: Ham-Policy

Ham-Policy Digest Tue, 20 Apr 93 Volume 93 : Issue 108

Today's Topics:

Send Replies or notes for publication to: <Ham-Policy@UCSD.Edu>
Send subscription requests to: <Ham-Policy-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Policy Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-policy".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Tue, 20 Apr 1993 22:26:20 GMT
From: sdd.hp.com!saimiri.primate.wisc.edu!eng.ufl.edu!usenet.ufl.edu!gatech!
wa4mei!ke4zv!gary@network.UCSD.EDU
Subject: 10meters (Give it to CB)
To: ham-policy@ucsd.edu

In article <1396@arrl.org> zlau@arrl.org (Zack Lau) writes:
>In rec.radio.amateur.policy, mswmod@nimbus.sage.unr.edu (stark) writes:
>>
>>The skip conditions were very well known then. In fact, there was almost
>>no activity on 2 meters. Most of the nets etc were on 10. Very few could
>>afford the cost of 2 meter gear. Home brewing up in those high freqs was
>>just about more than the average ham could do. It would be like the
>>average ham now trying to build something at say 10 gig.
>
>Interesting. Maybe Gary is right and I *am* overestimating the
>abilities of people on the net. I thought that if you could get
>rid of all the tuning adjustments and machine shop work, average

>hams could build it. I know Down East Microwave has been selling
>10 GHz no-tune preamp kits for several years now. Maybe it is
>the need for using a sharp knife to cut holes in the circuit
>boards. :-).
>
>I guess I shouldn't estimate how many amateurs could build a 10 GHz
>ground plane.
>
>So, what *can* average amateurs build?

Well 10 GHz isn't really a good example, gunplexers make it too easy.
But preamp kits aren't communications systems either. Down East *kits*
do make construction remarkably easy, but scratch building stable LOs
and image rejection mixers at microwave requires test equipment and
sophisticated knowledge of component behavior that most hams don't
have. That was the problem at 2 meters in the era referred to above.
Hams had test equipment for, and working knowledge of, lumped constant
networks at HF, but VHF was still a mystery. It was a place where
leads became components and where familiar tubes behaved strangely.
Today it's just a matter of plugging gain blocks together and testing
with high stability tunable factory radios, but back then getting a
tunable radio project *in the band* at two meters was an accomplishment.

My first foray above 30 MHz was a stab at a 432 station using a 6AF4
preamp, diode mixer, and a three tube LO chain on recieve, and 2 12AT7s,
a 2E26, and a 829B on transmit. I didn't have access to any test equipment
in the range, just a homemade set of lecher wires, a #47 bulb, and a VOM.
Cleaning the spurs out of the LO, and taming the preamp oscillations were
months long projects in themselves. When it finally worked, and my wooden
boomed yagi was in the air, I found out there was no one else within contact
range.

Today, a single receiver chip, a couple of MMICs, and a power brick
can have me on 2 meters in a matter of hours dead bug style with a
respectable FM signal. I can tweak the tuned networks with the tracking
generator and spectrum analyser in minutes. But it wasn't always thus.
The two greatest things needed for experimental building are adequate
test equipment, and the knowledge of how components behave at a given
frequency and what to do when they go squirrelly. The former is much
easier to get today, at least through 1 GHz, but the latter has to be
earned with burnt fingers and lots of head scratching.

Gary
--

Gary Coffman KE4ZV	You make it,	gatech!wa4mei!ke4zv!gary
Destructive Testing Systems	we break it.	uunet!rsiatl!ke4zv!gary
534 Shannon Way	Guaranteed!	emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244		

Date: Wed, 21 Apr 1993 01:08:09 GMT
From: usc!sol.ctr.columbia.edu!news.unomaha.edu!nevada.edu!jimi!physics.unr.edu!
nimbus!mswmod@network.UCSD.EDU
Subject: 10meters (Give it to CB)
To: ham-policy@ucsd.edu

In article <1396@arrl.org> zlau@arrl.org (Zack Lau) writes:
>In rec.radio.amateur.policy, mswmod@nimbus.sage.unr.edu (stark) writes:
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>>no activity on 2 meters. Most of the nets etc were on 10. Very few could
>>afford the cost of 2 meter gear. Home brewing up in those high freqs was
>>just about more than the average ham could do. It would be like the
>>average ham now trying to build something at say 10 gig.
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>Interesting. Maybe Gary is right and I *am* overestimating the
>abilities of people on the net.

>I thought that if you could get
>rid of all the tuning adjustments and machine shop work, average
>hams could build it.

Maybe, but I wouldn't bet too much on it. Most hams today don't
understand much of what go on inside their little boxes. Another
good argument for cw. A good place to learn how things work. I
would hate to start learning radio theroy by studing something
like a 757 etc.

>I know Down East Microwave has been selling
>10 GHz no-tune preamp kits for several years now. Maybe it is
>the need for using a sharp knife to cut holes in the circuit
>boards. :-).
>
>I guess I shouldn't estimate how many amateurs could build a 10 GHz
>ground plane.
>
>So, what *can* average amateurs build?
>

I wasn't including "kits" as building. Someone else has done all
the hard work for you. Kits can be fun etc, but that's not quite
the same. Tho they are a lot better than nothing.

>Zack Lau KH6CP/1
>

Let me ask you this Zack, how many hams do you know who have never owned a soldering iron? How many that don't even own a little multi meter?

When I became active again a few years ago things had changed a lot. Most newer hams just wanted to operate. No disire to figure out what makes things tick. Maybe it's just a sign of the times.....

73s, Ron, KU7Y

Date: Tue, 20 Apr 93 20:01:32 GMT
From: usc!howland.reston.ans.net!agate!headwall.Stanford.EDU!nntp.Stanford.EDU!umunhum!paulf@network.UCSD.EDU
Subject: CW = effective utilization?
To: ham-policy@ucsd.edu

In article <1993Apr20.174929.7145@nntpd2.cxo.dec.com> little@nuts2u.enet.dec.com (nuts2u::little) writes:
>Ah, but the current digital modes can also transfer much more
>information per unit time than CW can.

Yes, but that's only part of spectral efficiency. What matters from a regulatory policy viewpoint is the amount of spectrum occupied per user, the "spectrum reuse" factor. Someone typing during a QSO with CLOVER still uses five times as much spectrum during that QSO period.

>Will it cost quite a bit more than a keyer? Well lets see,
>many (most?) shacks now have computers.

That's probably true of the USENET population, but no, it's not true of the general ham population. In any event, the best and most recent empirical example we have of a spectrally efficient digital modulation system is CLOVER, which is a bit more expensive than a Curtis 8044 these days.

You still havn't shown that a significant number of "codeless" amateurs introduced into HF would use such a system, and as such would not significantly increase the load on the HF bands. Those who currently do have full access to the HF bands have demonstrated such a commitment empirically.

>Evolve or face extinction. Or are you balkanizing Darwin's law?

Again, about a two on the JSMAHS.

--
-=Paul Flaherty, N9FZX | "Just name a hero, and I'll prove he's a bum."
->paulf@Stanford.EDU | -- Col. Gregory "Pappy" Boyington, USMC (ret)

Date: Tue, 20 Apr 1993 22:02:01 GMT
From: usc!howland.reston.ans.net!noc.near.net!squam.banyan.com!banyan.com!
dts@network.UCSD.EDU
Subject: CW = effective utilization?
To: ham-policy@ucsd.edu

In article <1993Apr20.161800.3415@leland.Stanford.EDU>, paulf@umunhum.stanford.edu
(Paul Flaherty) writes:
|> In article <9304200226.AB04700@netmail.microsoft.com> a-kevinp@microsoft.COM
(Kevin Purcell, Rho) writes:
|> >Paul you should stop these bogus "CW is the most effecient mode in
|> >100Hz". We all know that if you slow down an FSK signal and use ARQ we
|> >would have a digital mode with machines on both ends being more
|> >reliable and having a higher throughput than human driven CW.
|>
|> There's nothing "bogus" about the simple fact that all of the machine
|> generated digital modes take up five times the spectrum that CW does.
|> While it is true that with slow, low rate convolutional codes, you could
|> duplicate the functionality in the same bandwidth, I'm willing to bet that
|> such a system would be quite a bit more expensive than a keyer, and thus never
|> see widespread use.
|>

OK, so crank up your keyer to 20 or 30 WPM and turn on the spectrum analyzer and tell me how wide your transmitted signal is. NOT how wide a filter can be used to copy, how wide your transmitted signal IS. As you speed up code you ARE going to WIDEN your signal. A pure sine wave does not take up much space, but those sharp edges when you key on and off have something very much in common with SQUARE waves... remember what harmonics comprise a square wave?

Now, take that signal and pump it through your linear and tell me about the 100Hz wide signal you are outputting. Will I be able to work someone else 150 HZ above your center frequency? maybe, maybe not... Would your key clicks ring in my filters? probably.

So now for "all of those machine generated digital modes tak[ing] up five times the spectrum CW does." Really? interesting math. I seem to find that nearly all the RTTY signals I work fit nicely in the 250Hz narrow filter. Perhaps you are referring to the little bits of harmonics which are generated around the signals... makes 'em about 500Hz wide. Same kind of stuff that comes off those CW

signals. The RTTY signals only take up 250Hz when you look at the useful information content.

CW really should be improved through the use of better filtering so that it can fit in 5Hz per signal and stop wasting those vast quantities of spectrum on low speed noise.

|>
|>
|>
|>
|> --
|> -=Paul Flaherty, N9FZX | "Just name a hero, and I'll prove he's a bum."
|> ->paulf@Stanford.EDU | -- Col. Gregory "Pappy" Boyington, USMC (ret)

--

Daniel Senie Internet: dts@banyan.com
Banyan Systems, Inc. Compuserve: 74176,1347
508-898-1188 Packet Radio: N1JEB@WA1PHY.MA

Date: Tue, 20 Apr 1993 22:33:58 GMT
From: sdd.hp.com!saimiri.primate.wisc.edu!eng.ufl.edu!usenet.ufl.edu!gatech!
wa4mei!ke4zv!gary@network.UCSD.EDU
Subject: CW = effective utilization?
To: ham-policy@ucsd.edu

In article <1993Apr20.161800.3415@leland.Stanford.EDU> paulf@umunhum.stanford.edu (Paul Flaherty) writes:
>In article <9304200226.AB04700@netmail.microsoft.com> a-kevinp@microsoft.COM (Kevin Purcell, Rho) writes:
>>Paul you should stop these bogus "CW is the most effecient mode in
>>100Hz". We all know that if you slow down an FSK signal and use ARQ we
>>would have a digital mode with machines on both ends being more
>>reliable and having a higher throughput than human driven CW.
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>generated digital modes take up five times the spectrum that CW does.
>While it is true that with slow, low rate convolutional codes, you could
>duplicate the functionality in the same bandwidth, I'm willing to bet that
>such a system would be quite a bit more expensive than a keyer, and thus never
>see widespread use.

I suspect that there are already more TNCs in use than keyers despite their higher cost. Clover already approaches ultimate CW performance limits, though usually it operates by trading bandwidth for higher speed.

And the LOWFER system already far exceeds conventional CW performance
in bandwidth and weak signal performance. It can be built for under
$100.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

Date: Wed, 21 Apr 1993 03:44:47 GMT
From: pa.dec.com!nntpd2.cxo.dec.com!nuts2u.enet.dec.com!little@decwrl.dec.com
Subject: CW = effective utilization?
To: ham-policy@ucsd.edu

paulf@umunhum.stanford.edu (Paul Flaherty) writes:

>You still havn't shown that a significant number of "codeless" amateurs
>introduced into HF would use such a system, and as such would not
>significantly increase the load on the HF bands. Those who currently do
>have full access to the HF bands have demonstrated such a commitment
>empirically.

Excuse me? There is no empirical evidence that the current users have a
commitment to not place a load on the HF bands. You may attribute the
any behavior to any reason you want, but that is simply attribution
theory. Proving commitment takes much more than simple observation.

So to change the licensing requirements, you're suggesting that it
is necessary to prove that spectral utilization of the HF bands won't
increase???? Or should I take your other post that says we can cram as
many no-coders on the HF bands as we like as long as each one doesn't use
more spectrum than a CW operator? First one sounds like NIMBY (I can
use acronyms too. ;-) and the other if applied equally to all hams would
prohibit all modes except the most spectrally efficient.

If your argument for the CW requirement is a fear of overloading the SSB
bands but not the CW bands, then why is 13 or 20 WPM required to use most
of the CW allocations of the HF bands? If your argument is spectral
efficiency, then why does one have to learn to manually send and receive 13
or 20 WPM. I personally have made many contacts on CW without ever
touching a key (or bug or paddle.) With my station, I can send and receive
at more than 50 WPM of CW thanks to my multi-mode data controller. So how
is that any different than banging it out by hand with respect to spectral

efficiency?

>>Will it cost quite a bit more than a keyer? Well lets see,
>>many (most?) shacks now have computers.
>
>That's probably true of the USENET population, but no, it's not true of the
>general ham population. In any event, the best and most recent empirical
>example we have of a spectrally efficient digital modulation system is
>CLOVER, which is a bit more expensive than a Curtis 8044 these days.

Again, must be the Chicago difference. The amateurs I talk to in the Chicago area mostly seem to have computers. A quick scan of the local repeaters usually finds one QSO about operating those new fangled pieces of equipment. Perhaps its just those VHFers, you know, those appliance operators. They didn't canabilize the family's table top radio to make their equipment, they just go out and buy whatever they want for the immediate gratification it brings. :-)

Also, why would some spectrally efficient modulation system be any more expensive than packet? In fact it ought to be cheaper since there is no need for upper level protocols. PMP is certainly not "quite a bit more expensive" than a keyer. Both are one chip and some miscellaneous components. Yet I hear that packet is getting out of hand and taking over the world. Must not be too expensive.

73,
Todd
N9MWB

Date: Tue, 20 Apr 93 19:05:57 GMT
From: usc!howland.reston.ans.net!bogus.sura.net!news-feed-1.peachnet.edu!umn.edu!
csus.edu!netcom.com!netcomsv!orchard.la.locus.com!prodnet.la.locus.com!
lando.la.locus.com!dana@network.UCSD.EDU
Subject: I like it, so everybody should like it
To: ham-policy@ucsd.edu

I've used Intel 8051 processors in several ham radio related projects.
I liked them, so I think everybody should have to use them. We should
change the license exam so, even to get a Novice license, one must write
a real-time kernel in 8051 assembler by memory.

I like listening to (among other things) head-banger music. We should
change the Extra class exam so you have to write down all the words to
all the songs on Metallica's _And Justice For All_, with no mistakes.

I like eating sushi, so maybe we should change the Technician exam so

everyone has to eat a couple of sea urchins in addition to the written exams.

I like riding motorcycles, and motorcycles are easier to park and save space in parking structures, so I think everyone should have to learn how to race a motorcycle to get a ham license. Heck, when I stopped whining and just did it, I even got my lap times down to 1:35 at Willow Springs. Maybe we could waive the road-racing ability for Novices and Technicians; they'd be No-Racers and we could make derisive comments about them. This would sure keep the riff-raff out.

I don't think I've ever had more fun than when I was ripped up drunk on Mezcal. Since I like it, maybe we ought to require everybody to drink, oh, say, 7 jiggers of Mezcal and not throw up to get a ham license.

I like playing the old Tempest arcade game; maybe a person should have to score more than 150,000 points on Tempest to get a ham license. Afterall, I like the game and found it relaxing, and *anyone* can score over 150,000 points if they just work it hard enough.

Maybe we ought to ask John DeArmond what peculiar things he likes and put them in the ham licensing....

--
 * Dana H. Myers KK6JQ | Views expressed here are *
 * (310) 337-5136 | mine and do not necessarily   *
 * dana@locus.com DoD #466 | reflect those of my employer
    *
 * This Extra supports the abolition of the 13 and 20 WPM tests *

Date: Tue, 20 Apr 1993 21:39:53 GMT
From: usc!howland.reston.ans.net!gatech!emory!wa4mei!ke4zv!gary@network.UCSD.EDU
Subject: Just waiting the OFs out
To: ham-policy@ucsd.edu

In article <1394@arrl.org> lhurder@arrl.org (Luck Hurder KY1T) writes:
>In rec.radio.amateur.policy, gary@ke4zv.uucp (Gary Coffman) writes:
>>
>>...The IARU is a creature of the ARRL, ...
>
>
>Really! I'll have to relate that to the IARU; they'll be SOME
>surprised...

Ask them who formulated the IARU structure, who pays the bills for many member societies' participation in meetings, who does the

publishing and scheduling of IARU activities, etc.

Gary

--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

Date: Tue, 20 Apr 1993 21:36:14 GMT
From: usc!howland.reston.ans.net!europa.eng.gtefsd.com!emory!wa4mei!ke4zv!gary@network.UCSD.EDU
Subject: My thoughts...
To: ham-policy@ucsd.edu

In article <Ny6a3B1w165w@stock.apana.org.au> justin@stock.apana.org.au (Justin Fanning) writes:
>As for packet, that is an even bigger fraud of spectrum, their is no
>"Experimentation" going on, just users taking advantage of the available
>spectrum to setup their own personal or club packet bbs systems. The
>computers are BOUGHT, the transmitters are BOUGHT, the antenna is BOUGHT
>and the software is BOUGHT (or copyed) WHERE IS THE EXPERIMENTATION!

Where is it written that you must STEAL to do experimentation? All experimentation requires acquiring the necessary components and tools to do the experiments. Honorable people PURCHASE those necessary components. Whether the component is a rotary spark gap, a vacuum tube, a transistor, an IC, or a TNC is only a matter of level of integration and abstraction of *components* in an experimental system.

Many packet operators serve only as test data generators for those doing network and messaging system experimentation and development, but that's an important part of the process. Many packet operators are participants in ad hoc networking experiments. The results of these tests and experiments have shown the futility of digipeaters and spurred the development of full digital repeaters, Netnode systems, TCP/IP over radio routers, cooperative mail handling systems, and the like. Other results of the experimentation by ordinary users has pointed component developers in the direction of higher speed modems, weak signal modems, and narrow bandwidth systems like Clover. Without user testing and validation there's little reason to believe that commercial users would have TNCs for their data systems, or that the US Army would have purchased thousands of amateur developed TNCs for Desert Storm. The amateurs did the hard work to discover how to make these components workable parts of datacom systems

with unreliable links and changing network configuration.

Hardware is only a small part of packet, firmware only another
small part. The biggest part is the cooperative structures developed
by ordinary hams to create ad hoc radio networks. This is a very
new thing. Before the work by amateurs, networks were pre-planned
static structures, aside from some ARPA experiments. It was amateurs
buying TNCs, radios, computers, and software and throwing them on
the air helter skelter who found out the pluses and minuses of ad hoc
networking and ways of dealing with them. This is still an infant
field and amateurs continue to do pioneering work probing various
network structures and working on exploratory routing methods.
Even someone who doesn't know which end of a soldering iron is
hot and who thinks a union is something teamsters join is in a
very real sense an experimenter with packet networks.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

Date: Tue, 20 Apr 93 19:33:23 GMT
From: usc!howland.reston.ans.net!agate!headwall.Stanford.EDU!nntp.Stanford.EDU!
umunhum!paulf@network.UCSD.EDU
To: ham-policy@ucsd.edu

References <1993Apr19.174801.27371@nntpd2.cxo.dec.com>,
<1993Apr19.231621.12745@leland.Stanford.EDU>, <1r0has$368@cc.tut.fi>
Subject : Re: OO != Slow

In article <1r0has$368@cc.tut.fi> k23690@lehtori.cc.tut.fi (Kein{nen Paul) writes:

>I don't see how you can call a modulation method spectrally efficient
>if it requires 50 - 100 Hz to transfer 20 WPM (about 12 bit/s) and it
>is even less efficient at lower speeds.

Spectral efficiency has to be taken in terms of bandwidth per user, as well
as in bits per hertz, and economics as well. Otherwise you're comparing
apples with oranges. True, you can get to within 50% of the Shannon bound
these days, using better modulation schemes, but unless it occupies less than
100 Hz, and is as accessable to the average ham as the manual techniques,
it won't be used.

--
-=Paul Flaherty, N9FZX | "Just name a hero, and I'll prove he's a bum."
->paulf@Stanford.EDU | -- Col. Gregory "Pappy" Boyington, USMC (ret)

Date: Wed, 21 Apr 1993 00:02:47 GMT
From: swrinde!gatech!concert!samba!usenet@network.UCSD.EDU
To: ham-policy@ucsd.edu

References <1993Apr16.023100.1889@btree.uucp>, <Ny6a3B1w165w@stock.apana.org.au>,
<1993Apr20.213614.29801@ke4zv.uucp>
Subject : Re: My thoughts...

My experiences as a no-code ham have been good, even while visiting a
metropolitan area (Los Angeles), I seem to have been welcomed with open
arms (ears?) by everyone except the no-code bashers on Usenet.

This latest thread about 2m=CB has gotten me thinking. How is using an
outdated mode of communications (ie: CW) to do contesting, ragchews,
and signal report exchanges to get that coveted QSL card so much more
"experimental" or justified than a 2m rag-chew? It seems to mee that
there's room in amateur radio for everyone, whether they're hard-core
hardware hackers into building their entire system themselves (I can
only assume you're not reading handbooks to get your design plans) or
someone interested in doing public safety comms, learning about simple
antenna design, writing packet software, contesting, or whatever suits
their fancy.

I read this newsgroup for more than two years prior to taking the exam
and getting licensed, and the cw bigots didn't scare me away. I can
only hope that other newcomers aren't scared away from this great
hobby.

-ks
KD6RCT

--
   The opinions expressed are not necessarily those of the University of
     North Carolina at Chapel Hill, the Campus Office for Information
        Technology, or the Experimental Bulletin Board Service.
           internet: laUNChpad.unc.edu or 152.2.22.80

Date: Tue, 20 Apr 1993 22:40:47 GMT
From: swrinde!gatech!wa4mei!ke4zv!gary@network.UCSD.EDU

To: ham-policy@ucsd.edu

References <1993Apr19.231621.12745@leland.Stanford.EDU>,
<1993Apr20.032014.15545@muug.mb.ca>, <1993Apr20.164432.4100@leland.Stanford.EDU>
Reply-To : gary@ke4zv.UUCP (Gary Coffman)
Subject : Re: OO != Slow

In article <1993Apr20.164432.4100@leland.Stanford.EDU> paulf@umunhum.stanford.edu
(Paul Flaherty) writes:
>In article <1993Apr20.032014.15545@muug.mb.ca> bwalzer@muug.mb.ca (Bruce Walzer)
writes:
>>Neat! Ok, 20 WPM works out to something like 20 baud with 10 bit characters.
>>With FSK it wouldn't be to hard to fit that into something like 80 Hz. You'd
>>use a DSP to demodulate. Just let the no-codes operate below 30 MHz with the
>>restriction that they could not occupy more than lets say 100 Hz (they might
>>want to add some error correction overhead and still get that "CW" thruput).
>
>I'd find that quite acceptable (especially if such licensees were actually
>required to show knowledge of such techniques), but I have a funny feeling
>that others would not. You still need to show that the end result wouldn't
>be an overcrowding of the SSB portions of the bands.

Well the primary reason for overcrowding of the voice portions of the
HF bands is that nearly half of the spectrum is restricted from use by
voice operators at all, and another portion is restricted to only those
who exhibit irrelevant to voice operations high speed CW skills.

Gary
--
Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

End of Ham-Policy Digest V93 #108
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